

**CPR Hastings Tap Wilson Creek Water Analysis**

from

Sample of water taken Wilson Creek from Ruby's pipe connecting creek to a pump in a casing.

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 MINISTRY OF THE ENVIRONMENT

WATER QUALITY REPORT FOR SAMPLE 300436W

TO: HANK HASTINGS  
 RR 1 ROSEBERY  
 NEW DENVER BC VOG 180  
 ATTENTION OF: HANK HASTINGS

FOR SITE: HASTINGS TAP WATER CPR BUNKHSE ROSEBERY BC

SAMPLING DATE(S): JAN 12/83 0800 HRS  
 DATE PROCESSED TO COMPUTER: JAN 17/83

PH	8.0	RESIDUE: FILTERABLE	88.
	REL UNIT		MG/L
SPECIFIC CONDUCTANCE	134.	TURBIDITY	0.3
	UMHO/CM		N.T.U.
ALKALINITY: TOTAL	56.3	FLUORIDE	0.22
	MG/L		MG/L
HARDNESS	58.7	NITROGEN: NITRATE (NO3)	0.13*
	MG/L		MG/L
NITROGEN: NITRITE (NO2)	L 0.005*	BORON TOTAL	L 0.01
	MG/L		MG/L
CALCIUM TOTAL	18.4	CHROMIUM TOTAL	L 0.01
	MG/L		MG/L
COPPER TOTAL	L 0.01	IRON: TOTAL	0.06
	MG/L		MG/L
MAGNESIUM TOTAL	3.09	MANGANESE TOTAL	L 0.01
	MG/L		MG/L
ZINC TOTAL	0.12	BARIUM TOTAL	0.05
	MG/L		MG/L
COLIFORMS: TOTAL	5.1		
	M.P.N.		

REMARKS: "COLIFORMS:TOTAL" - TEST PERFORMED BY DIVISION OF LABORATORIES,  
 MINISTRY OF HEALTH  
 THE SYMBOL "L" REPRESENTS LESS THAN  
 THE SYMBOL "G" REPRESENTS GREATER THAN  
 "Coliforms: Total" - Sample 6 days in transit; completed test not done.  
 Confirmed test reported.

  
 FOR ENVIRONMENTAL LABORATORY

WATER QUALITY CHECK PROGRAMME

INTERPRETATION BOOKLET

Prepared by: The Environmental Laboratory,  
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In consultation with:  
The Ministry of Health.

September 1982.

Water Quality Check Programme  
Guide to the Interpretation of Analyses.

The report you have received from the Environmental Laboratory shows twenty analytical results. This booklet is intended to help you understand that report. Included in this booklet are the "Canadian Drinking Water Standards" that you can use to compare your analyses to the accepted standards. If your analyses are above the Canadian standards then we recommend that you contact your local health unit for further recommendations.

Concentration levels may vary according to the time of the year (season and climatic conditions) your sample was taken. Spring run-off and fall rains can have an affect on some tests: the turbidity of the water could be high after a rain storm as the rain washes silt and dirt into the streams, and increases the turbidity; in the summer, if there is no water flow (stagnant conditions) and the temperature is warm, then conditions could be optimum for algae and bacterial growth. The limits for the twenty tests we report are:

"Canadian Drinking Water Guidelines"

Test	Maximum Acceptable Level (1)	Objective Level (2)
1 pH	6.5 - 8.5	(None)
2 Residue: filterable	500 mg/L (3)	(None)
3 Specific conductance	(None)	(None)
4 Turbidity	5 NTU (4)	L 1. NTU
5 Alkalinity: total	30 to 500 mg/L	(None)
6 Fluoride	L 1.5 mg/L	L 1.0 mg/L
7 Hardness (*)	(none--see below)	(none--see below)
8 Nitrogen:Nitrate(NO3) as N	L 10.0 mg/L	L .001mg/L
9 Nitrogen:Nitrite(NO2) as N	L 1.0 mg/L	L .001mg/L
10 Calcium (*)	(none--see below)	(none--see below)
11 Iron	L 0.3 mg/L	L .05 mg/L
12 Magnesium(*)	(none--see below)	(none--see below)
13 Coliforms: total	L 2.2 MPN (5)	L 2.2 MPN
14 Barium	1.0 mg/L	L 0.10 mg/L
15 Boron	5.0 mg/L	L 0.01 mg/L
16 Chromium	0.05 mg/L	L 0.0002 mg/L
17 Copper	1.0 mg/L	L 1.0 mg/L
18 Manganese	0.05 mg/L	L 0.01 mg/L
19 Zinc	5.0 mg/L	L 5.0 mg/L

(\*) Reference: Water Quality Sourcebook - Inland Waters Directorate, Environment Canada (1979)

Hardness	L 120 mg/L	L 120 mg/L
Calcium	L 200 mg/L	L 75 mg/L
Magnesium	L 150 mg/L	L 50 mg/L

- (1) Maximum acceptable level for health or aesthetic reasons.
  - (2) Objective level-a desired level to be achieved.
  - (3) mg/L is milligrams per liter.
  - (4) NTU is Nephelometric Turbidity Units.
  - (5) MPN is Most Probable Number.
- "L" means less than"- L 10.0 mg/L means less than ten milligrams per liter.

The following are brief descriptions of the tests and what the results could mean.

(1) pH:

Definition- This is the measurement of the hydrogen ion concentration in the water. A pH between 0 and 7 is acidic (the lower the number the more acidic the water), a pH of 7 is neutral, and a pH of 7 to 14 is increasingly alkaline.

Importance- The acceptable level for drinking water is between 6.5 and 8.3. Corrosion of metal plumbing may occur at low pH values. "Scaling" or encrustation of metal pipes may occur at high pH values.

(2) Residue: filterable:

Definition- This is a measurement of the total dissolved material present in the water sample. The dissolved material may be salts of iron, calcium, magnesium, etc., or they may be water-soluble organic compounds.

Importance- The maximum acceptable level is less than 500 mg/L. High levels may cause a laxative effect on some people. Low levels have been considered desirable because they contribute to the palatability of drinking water.

(3) Specific Conductance:

Definition- This is the measurement of the ability of the water to conduct an electric current- the greater the ion content (dissolved metals and other dissolved inorganic constituents) of the water, the greater its ability to conduct electricity. It is reported in terms of micromhos per centimeter (umho/cm). There is no standard level recommended for specific conductance. Natural waters are found to vary between 50. and 1500. umho/cm.

Importance- Specific conductance may be used to estimate the total ion concentration of the water.

(4) Turbidity:

Definition- This is the measurement of the suspended particulate matter in the water which interferes with the passage of a beam of light through the water; the material could be silt, clay, organic material, or micro-organisms.

Importance- Turbidity values may be high during and after periods of high rainfall, as silt may then be washed into streams and wells. High levels of turbidity may protect micro-organisms from the effects of disinfection procedures. It may also stimulate the growth of bacteria and thus increase the chlorine demand (bleach) required to disinfect the water.

(5) Alkalinity:

Definition- This is the measurement of the water's ability to neutralise acids. It usually indicates the presence of carbonates, bicarbonates, hydroxides, and/or other anions. Alkalinity results are expressed in terms of an equivalent amount of calcium carbonate. This does not mean, however, that carbonate was present in the water sample.

Importance- Natural waters rarely exceed levels of 500 mg/L. A range of 30 to 500 mg/L is acceptable, however, extreme variations, or high values may cause gastro-intestinal problems in human beings.

(6) Fluoride:

Definition- This is the measurement of the fluoride found in the water sample. It may be there as the result of the natural decomposition of rocks, or, as a result of a community fluoridation programme.

Importance- Fluoride has been found to prevent tooth decay and consequently fluoridation programmes have been established to treat water supplies. Excessive amounts of fluoride can, however, result in mottled tooth enamel. The maximum acceptable level is 1.5 mg/L.

(7) Hardness:total:

Definition- This is the measurement of hardness in the water which is due to the presence of dissolved calcium and magnesium salts. Other metallic ions may contribute to hardness however they are usually present in insignificant amounts. Hardness is expressed in terms of milligrams per liter (mg/L) of an equivalent amount of calcium carbonate.

Importance- Water hardness can refer to the water's capacity to produce a lather with soap as the minerals react with the soap to produce insoluble curds— the harder the water, the less lather is produced. An acceptable level for hardness is between 80 and 100 mg/L. "Soft water" may have corrosive effects on plumbing, while "hard water" may result in scale deposits in pipes. If the water has a hardness greater than 500 mg/L it is probably unacceptable for most domestic purposes.

(8) Nitrogen:Nitrate(NO3) as N:

Definition- This is the measurement of the most oxidized form of nitrogen in the water sample.

Importance- High nitrate values can decrease the blood's oxygen carrying capacity. This is important with infants who may develop "methaemoglobinaemia". The maximum limit is 10.0 mg/L of [nitrate + nitrite] nitrogen. The objective to be achieved is less than 0.001 mg/L.

(9) Nitrogen:Nitrite(NO<sub>2</sub>) as N:

Definition- This is the measurement of an intermediate form of oxidation of the nitrogen in the water before it becomes nitrate.

Importance- The presence of nitrite generally indicates the water is undergoing active biological processes which can be caused by organic wastes or pollution. The maximum level acceptable is 1.0 mg/L.

(10) Calcium:

Definition- This is the measurement of the amount of calcium in the water.

Importance- Calcium is quite common in water and contributes to the "hardness" of the water. Concentrations as high as 1800 mg/L have proven harmless, but, in some cases it may contribute to the formation of kidney stones in humans. The maximum acceptable concentration has been set at 200 mg/L, and the objective level at 75 mg/L.

(11) Iron:

Definition- This is the total measurement of the dissolved and the particulate iron in the water.

Importance- A limit of 0.3 mg/L has been set for aesthetic reasons. At levels above that iron may stain plumbing fixtures and clothing; it may give the water a bittersweet astringent taste; and, it may contribute to scaling which can encrust pipes. Excessive amounts may also encourage bacterial growth which may be observed as a slimy coating in pipes, and contribute to the taste and odour of the water.

(12) Magnesium:

Definition- This is the measurement of the magnesium found in the water.

Importance- Magnesium is reported to be non-toxic. It may be in the water as a result of the natural dissolving of rocks such as limestone and dolomite. It's presence in water is desirable because it contributes to the palatability of the water; it is also beneficial for the heart and nervous system. It can, however, cause a mild laxative effect in some people, until they become accustomed to the water, when they use a water source containing over 50 mg/L.

(13) Coliforms: total:

Introduction- No bacteriological analysis of water can take the place of a complete knowledge of the conditions at the source of the supply. Contamination is often intermittent and may not be revealed by the examination of a single water sample. Therefore, if a sanitary inspection shows a water source to be

obviously subject to pollution, the water should be considered unsafe irrespective of the results of bacteriological examination.

Definition- The total coliform group (of micro-organisms) include fecal coliforms which are common to the intestinal tract of man and animals and also nonfecal coliform organisms which have been found in soils and on vegetation.

Importance- The precise sanitary significance of the total coliform test may be difficult to establish. Nonfecal coliform organisms tend to survive longer in water than either the fecal coliform or the commonly occurring bacterial disease organisms. The total coliform test is, therefore, offered as an indicator of bacterial contamination in the "Water Quality Check Program."

Interpretation of Test Results-

Coliform is reported as the most probable number (MPN) of coliform bacteria found in 100 ml. of the water sample tested (MPN index per 100 ml.)

<u>MPN Index</u> <u>(per 100 ml.)</u>		<u>Meaning</u>
Less than 2.2	(0/5)*	Bacteriologically safe water indicated.
2.2	(1/5)*	Coliform bacteria were present in the sample submitted. The source of supply is, therefore, suspect and water treatment is recommended - (boil, chlorinate or use an alternate method of water disinfection.)
5.1	(2/5)*	
9.2	(3/5)*	
16.0	(4/5)*	
Greater than 16.0	(5/5)*	

\* The numerator of the fraction indicates the number of test tubes showing the presence of coliform organisms. The denominator indicates the number of tubes tested (5).

In cases where the water supply is suspect, it is suggested you contact your local Public Health Inspector for advice.

Coliform test results may be reported in three ways:

- (a) Presumptive Test: Reported if no indication of coliform is found.
- (b) Confirmed Test: A further identification step used if the Presumptive Test was positive and the sample was over four days old.
- (c) Completed Test: Reported if the Presumptive Test and Confirmed Test were positive and the sample was not over four days old.

It is important that the sample be analyzed within four days of sampling to obtain completed test results.

- (14) Barium:  
Definition - This is the measurement of the barium in the water.  
  
Importance - The maximum limit of 1.0 mg/l has been set for barium because ingestion may cause toxic effects to the heart, blood vessels, and nerves. The toxic effects at low levels are still uncertain.
- (15) Boron:  
Definition - This is the measurement of Boron in the water.  
  
Importance - The maximum limit has been set at 5.0 mg/l on the basis of health considerations. It can effect the central nervous system, gastro-intestinal tract, kidneys, liver and skin. Children or adults with kidney problems are more susceptible.
- (16) Chromium:  
Definition - This is the measurement of the chromium found in the water.  
  
Importance - The maximum limit has been set at 0.05 mg/l on total chromium for health reasons. The toxic effects are attributed to the hexavalent form of chromium. Chlorination may oxidize chromium in water to this form. Some chromium compounds are essential for biological reasons.